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CLAIMS

What is claimed is:

1. A composition for preservation of a cellulose based product, the composition comprising a mixture of:
 - a primary diamine in a volume ratio ranging from about 3.6% to about 12.2% v/v of the total solution; and
 - a secondary diamine in a volume ratio ranging from about 0.6% to about 6.8% v/v of the total solution.
2. The composition of claim 1 comprising from about 5.8% to about 9.6% v/v of the primary diamine and from about 2.4% to about 4.8% v/v of the secondary diamine.
3. The composition of claim 1 comprising from about 6.2% to about 7.8% v/v of the primary diamine and from about 2.8% to about 3.8% v/v of the secondary diamine.
4. The composition of claim 1 wherein the primary diamine and the secondary diamine are stoichiometrically balanced.
5. The composition of claim 1 wherein the primary diamine is a polyoxypropylene diamine.
6. The composition of claim 1 wherein the secondary diamine is a dialkylamino diphenylamines.
7. The composition of claim 1 further comprising a chain extension reagent.

8. The composition of claim 7 wherein the chain extension reagent is provided in an amount from about 2.0% to about 6.2% v/v of the composition.
9. The composition of claim 7 wherein the ratio of the primary diamine and secondary diamine to the chain extension reagent is from about 2.8:1 to about 3.8:1 by volume.
10. The composition of claim 7 wherein the chain extension reagent is selected from the group consisting of methylene-4,4'-diphenyl diisocyanate [MDI], MDI-containing resins, modified MDI, MDI-containing resins, aliphatic diisocyanates, aromatic diisocyanates, alicyclic diisocyanates, ethylene diisocyanate, ethylidene diisocyanate, propylene diisocyanate, butylene diisocyanate, cyclopentylene-1,3-diisocyanate, cyclohexylene-1,4-diisocyanate, cyclohexylene-1,2-diisocyanate, 2,4-tolylene diisocyanate, 2,6-tolylene diisocyanate, 4,4'-diphenylmethane diisocyanate, 2,2-diphenylpropane-4,4'-diisocyanate, p-phenylene diisocyanate, m-phenylene 15 diisocyanate, xylylene diisocyanate, 1,4-naphthylene diisocyanate, 1,5-naphthylene diisocyanate, diphenyl-4,4' diisocyanate, azobenzene-4,4'-diisocyanate, diphenylsulfone-4,4'-diisocyanate, dichlorohexamethylene diisocyanate, tetramethylene diisocyanate, pentamethylene diisocyanate, hexamethylene diisocyanate, 1-chlorobenzene-2,4-diisocyanate, furfurylidene diisocyanate and triphenyl methane triisocyanate
11. The composition of claim 1 further comprising a stabilizing carrier in an amount sufficient to prevent formation of a gel or solid prior to removal of a portion of the stabilizing carrier.

12. The composition of claim 11 wherein the chain stabilizing carrier is provided in an amount from about 60% to about 80% v/v of the composition.
13. The composition of claim 11 wherein the stabilizing carrier is selected from the group consisting of: acetone, methyl ethyl ketone, methylisobutylketone, N-methylcyclohexanone, acetaldehyde, propionaldehyde, butyraldehyde, isobutyraldehyde, methyl acetate, ethyl acetate, butyl acetate, methoxy propyl acetate, ethylene glycol, propylene glycol, butylene glycols, polyethylene glycol 200, polyethylene glycol 400 and polyethylene glycol 600.
14. The composition of claim 11 further comprising a secondary carrier for regulating viscosity.
15. The composition of claim 14 wherein the secondary carrier is provided in an amount from about 20% to about 38% v/v of the composition.
16. The composition of claim 14 wherein the secondary carrier is selected from the group consisting of: mineral spirits, N-methyl pyrrolidone and Solvesso solvent Lactone.
17. The composition of claim 1 further comprising a poly(oxyalkylene)polyol in an amount sufficient to support the function of the carrier solvent reactant.
18. The composition of claim 17 wherein the poly(oxyalkylene)polyol is provided in an amount from about 3.2% to about 4.6% v/v of the composition.

19. The composition of claim 17 wherein the poly(oxyalkylene)polyol is selected from the group consisting of: propylene oxide adducts of trimethylol propane, $(C_3HO)_{12}C_6H_{14}O_3$ and CAS #25723-16-4.
20. The composition of claim 1 further comprising a colorant or pigment.
21. The composition of claim 1 having a viscosity sufficient to enable impregnation of wood under a system of sequential vacuum and pressure, wherein the vacuum ranges from about 15 to about 28 in of mercury and the pressure ranges from about 1.5 to about 100 psi.
22. The composition of claim 21 wherein the vacuum ranges from about 20 to about 26 in Hg and the pressure ranges from about 20 to about 70 psi.
23. The composition of claim 21 wherein the vacuum ranges from about 15 to about 18 in Hg and the pressure ranges from about 25 to about 50 psi..

24. A wood product treated for preservation by coating or impregnating with a polyurethane linked copolymer formed by the sequential steps of
- combining an oligomeric, stoichiometrically balanced blend of primary and secondary diamines with modified diphenylmethane diisocyanates and a first carrier solvent/reactant to form a solution;
- coating or impregnating a wood product with the solution; and
- drying the solution to form a polyurethane linked copolymer coated or impregnated wood product.
25. The treated wood of claim 24 wherein the first carrier solvent/reactant comprises acetone.
26. The treated wood of claim 24 wherein the solution additionally includes a second carrier solvent/reactant.
27. The treated wood of claim 26 wherein the second carrier solvent/reactant comprises mineral spirits.
28. The treated wood of claim 24 wherein the solution additionally includes a polyether oxyalkylene polyol.
29. The treated wood of claim 24 wherein in the wood is isotropically impregnated.
30. The treated wood of claim 24 wherein in the wood is non-supportive of combustion.

31. The treated wood of claim 24 wherein the wood is termiticidal.
32. The treated wood of claim 24 wherein the wood meets non-hazardous landfill requirements for waste disposal.
33. The treated wood of claim 24 wherein the wood does not degrade from exposure to solar ultraviolet exposure.
34. The treated wood of claim 24 wherein polymerization of the polyurethane linked copolymer is initiated immediately upon application of the polyurethane linked copolymer to the wood, without a modification of external ambient conditions.
35. The treated wood of claim 24 wherein the polyurethane linked copolymer has a % distention-to-rupture value of about 450% to about 680%.
36. The treated wood product of claim 24 wherein the coating or impregnating step may be performed when the wood is damp.
37. The treated wood product of claim 24 wherein the solution further includes a colorant or stain.
38. The treated wood product of claim 24 wherein the wood product comprises a wood product previously treated with a CCA preservative, and wherein the application of the polyurethane linked copolymer essentially prevents leaching out of the CCA preservative.

39. The treated wood product of claim 24 wherein the wood product is impregnated with the solution under a system of sequential vacuum and pressure.
40. The treated wood product of claim 39 wherein the vacuum ranges from about 15 to about 28 in. of mercury and the pressure ranges from about 1.5 to about 100 psi.
41. The treated wood product of claim 40 wherein the vacuum ranges from about 20 to about 26 in. Hg and the pressure ranges from about 20 to about 70 psi.
42. The treated wood product of claim 40 wherein the vacuum ranges from about 15 to about 18 in. Hg and the pressure ranges from about 25 to about 50 psi.
43. The treated wood product of claim 24 wherein the polyurethane linked copolymer is applied to the surface of the wood product.

44. A method of substantially eliminating the leaching out of toxic preservative chemicals from conventionally treated wood, comprising:

combining an oligomeric, stoichiometrically balanced blend of primary and secondary diamines with modified diphenylmethane diisocyanates and a first carrier solvent/reactant to form a solution;

coating the conventionally treated wood with the solution; and

drying the solution to form a polyurethane linked copolymer coating on the conventionally treated wood that substantially eliminates the leaching out of toxic preservative chemicals from the conventionally treated wood.

45. The method of claim 44 wherein the conventionally treated wood is CCA-treated wood.

46. The method of claim 45 wherein the toxic preservative chemicals prevented from leaching out include copper, chromium and arsenic.

47. The method of claim 44 wherein coating the conventionally treated wood with the solution comprises coating conventionally treated wood in place in existing structures.

48. The method of claim 47 wherein coating conventionally treated wood in place in existing structures comprising spraying the solution onto the conventionally treated wood.

49. The method of claim 47 wherein coating conventionally treated wood in place in existing structures comprising painting the solution onto the conventionally treated wood.

50. The method of claim 47 wherein the solution additionally includes a colorant.